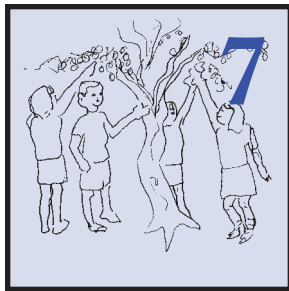
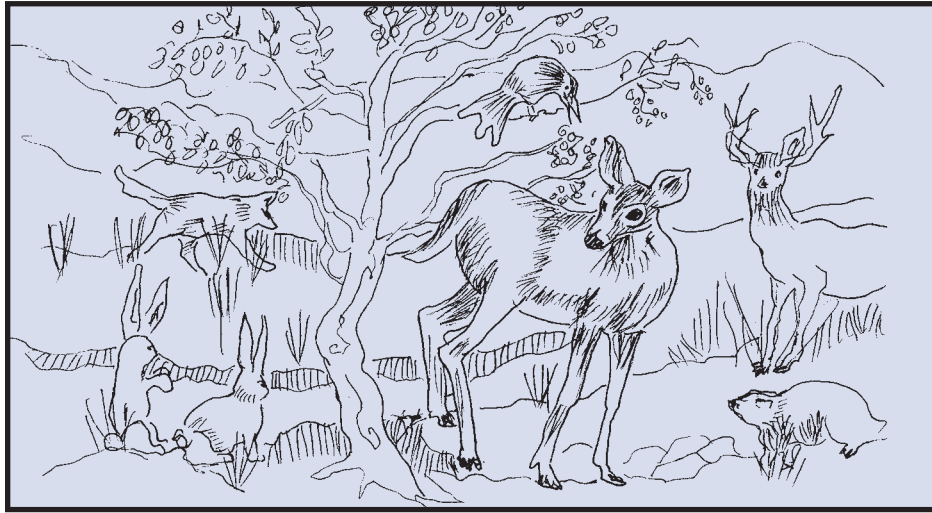


UNIT 4

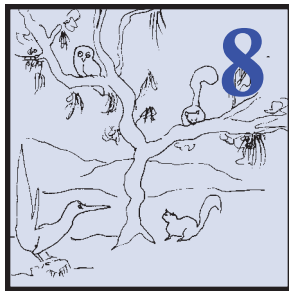
TREE OF LIFE



DRESS A TREE

Students will participate in an art activity in which they will learn about different parts of a mesquite tree, their functions and uses.

PAGE 4.5



MESQUITE HOUSE

Students will learn about the inhabitants of, and their relationship to, a mesquite tree while participating in a cut-and-paste craft activity.

PAGE 4.9

PARTS OF A MESQUITE

In the Santa Cruz Valley, the mesquite is the dominant species found bordering the river corridor. Native to the area, the mesquite provides habitat for a myriad of animals. It also played an essential role in sustaining life among the early O'odham and other people living in the area.

The basic botanical parts and functions of a mesquite tree are identical to that of any tree. The roots are the main support for the tree. They can reach a depth of 200 feet, depending on water level, soil conditions, and strong winds. The roots also function as the mouth of a tree. With the help of microrizoi fungus, they take in water and nutrients that are transported up through the trunk to the leaves.

The function of the trunk is to support the branches and leaves while conducting food and water upward. The center of the trunk is called heartwood. It is essentially dead wood that provides support, and allows the conduction of water and nutrients. Surrounding the heartwood is the sapwood or xylem cells, essential

for transporting water and nutrients up the tree. A thin, cell building cambium layer, is sandwiched between the sapwood and yet another layer called phloem, which is responsible for transporting photosynthesized sugar



down from the leaves to sustain other parts of the tree. The final layer is the bark, essentially dead phloem cells that serve to protect the tree, similar to the way our skin protects us.

The branches support the leaves, flowers, and fruit while also transporting water and nutrients. In many cases they can get almost as large as the trunk, spreading as wide as the tree is tall.

The mesquite tree produces an oblong bean pod, about eight inches in length. Regardless of heat, drought, or cold, each year a mature mesquite tree can produce more than 35 pounds of fruit, (about 140,000 seeds). It takes a number of years for germination to take

place because the bean is so hard. However, it can germinate in one season if it passes through the stomach of a ruminant. This means that domestic livestock such as cows and sheep help the germination process by spreading the seeds from place to place. Otherwise the seeds might lie on the ground for years, subject to infestation from insects. Many ranchers consider the mesquite to be a weed and have tried to eradicate the tree.

A mesquite flower is tiny and only a few millimeters in size. The many flowers grow clustered together in a long yellow bloom, one to three inches in length. They blossom from April through June. Only a few of the many flowers in each bloom will produce fruit which will eventually turn into bean pods. The flowers are visited and pollinated by flies, wasps, and over sixty varieties of bees.

The leaf of the mesquite tree is compound with many leaflets. They are small in order to conserve energy and water. The leaves provide shade during the hot summer months and fall off in winter. The fallen leaves then provide nutrient-rich ground cover.

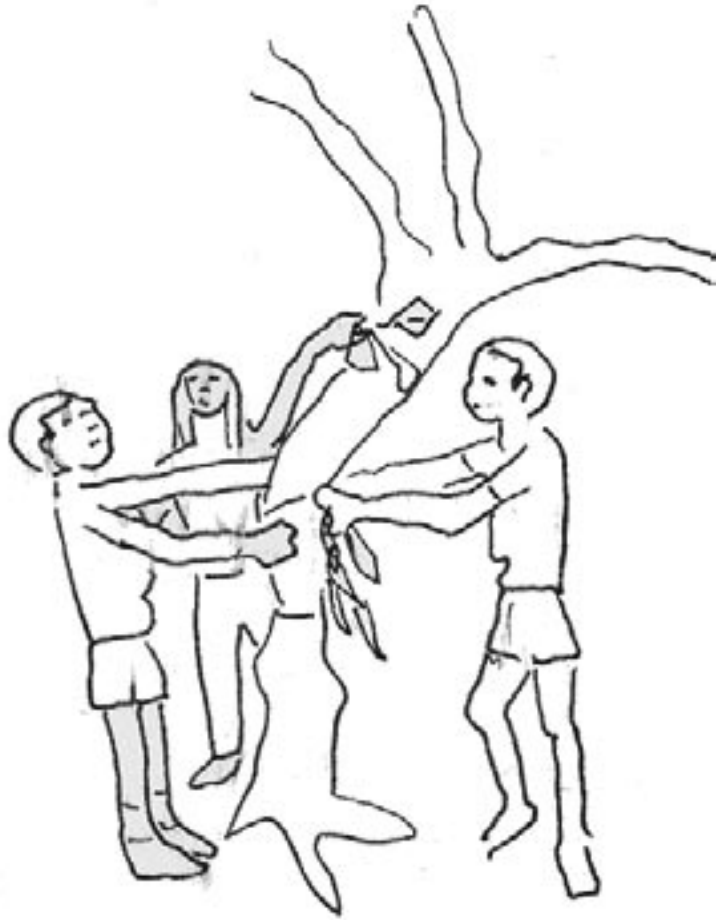
ETHNOBOTANY

(How people used the Mesquite)

Today, as in the past, the O'odham people grind the mesquite beans into a mealy flour. It is sweet, high in protein, and can be made into bread. Pods are traditionally gathered dry and toasted just before the summer rains. The flour is then fried or baked into tortillas, breads, and cakes.

Most southwestern tribes used all parts of the mesquite tree. The trunk and stems were used for making bowls, balls, planting sticks, awls, war clubs, trays, cradles, and firewood. Roots were used as a type of string. The O'odham built a *Ki* or traditional house made out of mesquite logs, ocotillo, mud, and other local materials. The black gum or tar can be dissolved to make a tea for head and stomach-aches. It can also be topically used as a cure for sunburn or other burns. Cosmetically, it was used as a form of chapstick or hair-dye. It was also used for pottery paint by boiling the resin.

Today, people still use the mesquite for medicinal purposes but it is more commonly used as firewood for grilling steaks and flavoring other foods.



MESQUITE AS HABITAT



The mesquite tree is found in washes of the Santa Cruz River Valley, on bottomlands, mesas, and sandy flats of the desert at elevations below 3,000 feet, and between 4,000

and 5,000 feet in the desert grasslands. The mesquite, a survivor, has adapted to the desert while providing a home or habitat for many animals.

GIANT MESQUITE BUG
(1,5).



One of the flashiest insects around is the Giant Mesquite Bug. The colorful adult can be two inches long, reddish-brown with yellow markings on the forewings, and have patterns that resemble a design found on a flag. The bug feeds exclusively off the mesquite by sucking up plant juices.

PRAYING MANTIS (1,2,4,5).

Among the well-known predatory insects is the Praying-Mantis. The desert species is well camouflaged and comes out in a desert soil brown, green, yellow, or tan. It uses the mesquite tree for a place to lay its eggs and as a hunting site for other insects.



CENTIPEDE (3)

The creature with "one hundred legs," commonly lives in the soil near or under a mesquite tree. It is three to six inches long with tan and darker bands.



It only comes out at night to hunt on small insects but will prey on lizards and small mice. Centipedes found in the Sonoran desert can issue a painful sting, but are not life-threatening to humans.

BARK SCORPION (4).

Another stinging friend is the Bark Scorpion. Mistaken for an insect but really in the spider family, it is light colored and small (about 2 inches



long). It has a neurotoxic venom that affects the whole body, making it the most dangerous of all scorpions in Arizona. It generally hides under tree bark, leaves, and debris, from which it feeds on soft-bodied insects. The bark scorpion is very common in Santa Cruz County.

VERMILLION FLYCATCHER (8).

Perhaps the most colorful inhabitant to be seen in the mesquite canopy is the Vermillion Flycatcher. It is normally migratory but is taking up permanent residence more and more. The male is about 6 inches long and has a bright vermillion-red breast with



black or grey on top and on its wings. True to its name, it demonstrates acrobatics from the branches of mesquites while looking for flying insects. It is quite common to find its nest tucked into the trunk of a tree.

THE GILA



WOODPECKER (4,6)

The Gila Woodpecker is a noted resident of the mesquite. The colorful red cap, black and white cape, and excessively noisy call,



makes identification of this bird easy. Nest cavities are dug into trees that also serve as hunting and gathering grounds. Their diet consists of insects, fruit, and eggs of smaller birds.

GREATER ROADRUNNER (7)

Known as the “clown of the desert,” this legendary bird can grow to be 23 inches long. It is one of the most proficient hunters, eating insects, lizards, spiders, scorpions, rodents and snakes, including

rattlesnakes. It uses the mesquite for cover and to climb if threatened.



GREY ROCK SQUIRREL (2,4,6)

The ground-dwelling Grey Rock Squirrel is common to the mesquite tree and the area. Up to 20 inches long with a large fluffy tail, this furry animal is in the



rodent family. Although considered cute, it can be a common carrier of plague or rabies, and therefore, like any wild animal, should not be fed or handled. It

uses the mesquite as a perch, to gather and eat a variety of foods, including bird eggs.

POCKET GOPHER (9)

An unwelcome and common garden visitor is the Pocket Gopher. Up to eleven inches long, it burrows under the mesquite tree, (one of the few plants it won't eat), and other trees.

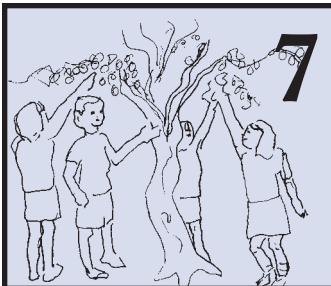
Its diet is primarily made up of plants, roots, and bulbs that are taken from below the surface of the ground.



COTTONTAIL RABBIT (10)

Another desert animal is the Cottontailed Rabbit. Often found resting under a mesquite tree or in the burrows of other animals. The cottontail's primary foods are grasses, mesquite leaves, and cactus.





LESSON OVERVIEW

Students will participate in an art activity in which they will learn about different parts of a mesquite tree, their functions and uses.

Subjects

Science and Art

Science Standards

Science as Inquiry,
Life Science

Objectives

Students will:

1. Classify and label different tree parts.
2. Construct a model of a tree and its parts.

Preparation

Make five copies of Master Page 4.7: Draw a picture or cutout a tree trunk in proportion to a large piece of paper and display it in front of the classroom. Supply construction paper (black, brown, beige, green and yellow), pencils, crayons or other colors, scissors and masking or double-sided tape.

Time

Two 50 minute sessions.

Vocabulary

Bark, buds, bean pod, flowers, leaves, mesquite, roots, stems and trunk.

DRESS A TREE



SESSION 1

1. Prior to the lesson, make a picture or a cut-out of a mesquite trunk and gather materials listed in “*Preparation.*”

Locate a mesquite tree(s) close to your classroom with enough space for your class to gather around it and explore.

2. Take your students out to the mesquite tree and ask them to explore the tree with their senses (smell, touch, sight, hearing and taste) If available, use magnifiers to see close-up details.

3. Hold a discussion about the mesquite tree while identifying its parts, functions and cultural uses as explained on **pages 4.1 and 4.2.**

4. Returning to the classroom, present to your students the pre-made trunk and display it in front of the class. Explain that it represents a tree trunk and that together they will “dress” it. Pose the following questions: “what parts do we need to dress on this tree, and what is the function of each part?” Review the basic parts of the tree (roots, trunk, stems, leaves, flowers, fruit beans, and bark).

5. Divide your class into five workgroups and assign each group one of the different parts: stems (black paper with white chalk or crayon), leaves (green paper), roots (brown paper), flowers (yellow paper), and beans (beige paper).

LESSON 7 - DRESS A TREE

6. Give each group art supplies and a copy of **Master Page 4.7** as a guide. Direct each student to illustrate and cut out one or more assigned tree parts. (There will be duplicates of each part).

7. When the tree parts are complete, have students label them while reviewing vocabulary and spelling.

8. Give students masking or double-sided tape and have them place the tape on the back of their tree part, ready to attach to the tree poster. (This step is important to expedite placing the parts on the trunk.)

2. Call students to individually dress their tree with tree parts. Starting with the roots, have each student obtain a root and attach the appropriate piece on the prepared trunk. Review each part and its function. Repeat this process for each part in sequence, (roots, branches, leaves, flowers and beans)

3. Once the tree is complete or “dressed,” review again the different parts, functions, and cultural uses.



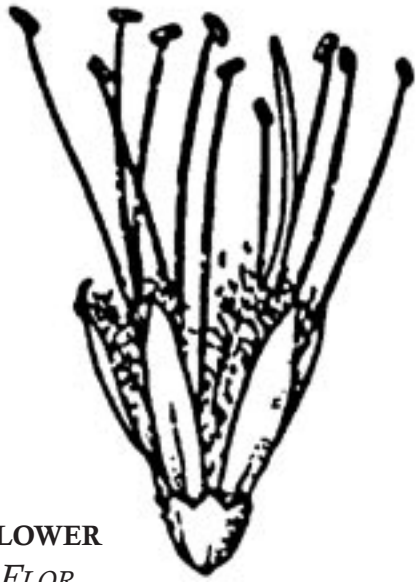
SESSION 2

1. Assemble the class and make sure that all students are ready to tape their tree parts onto the pre-made tree trunk, strategically placed at the front of the class.



ENRICHMENT

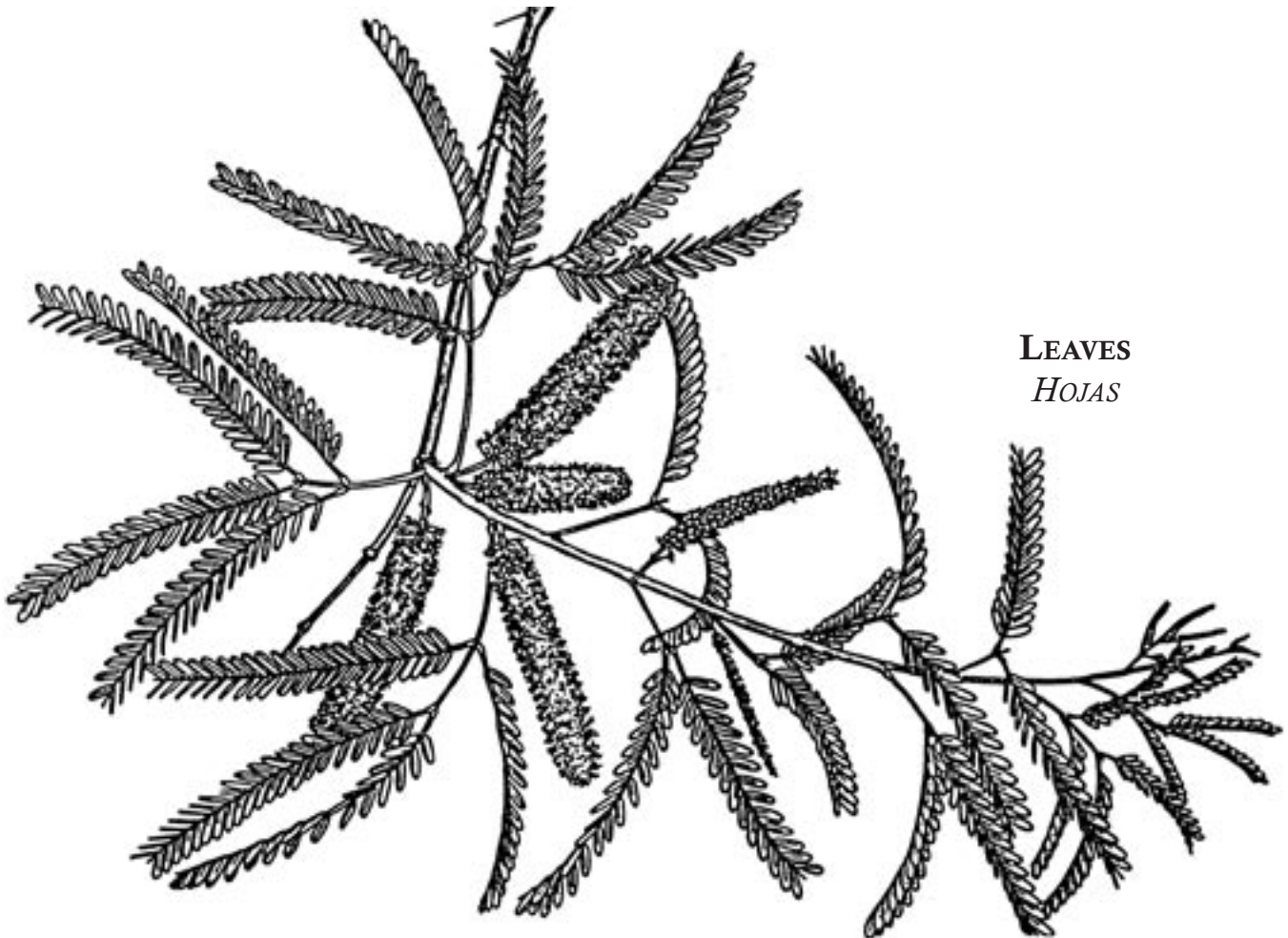
- Consider using dead or dried parts from an actual mesquite tree collected at or nearby the school. In doing so, please make sure that living trees are not damaged in the process.
- Have each student draw a tree and label all its parts.
- Listen and sing the song “*I’m a Tree*” or “*Roots, Flowers, Stems, Leaves, Fruits and Seeds*” by the Banana Slug String Band. (see Resources and References)



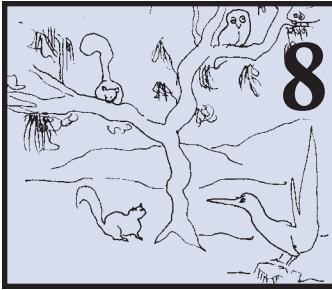
FLOWER
FLOR



BEANS
FRIJOLES



LEAVES
HOJAS



LESSON OVERVIEW

Students will learn about the inhabitants of, and their relationship to, a mesquite tree while participating in a cut-and-paste art activity.

Subjects

Natural Science, Art

Science Standards

Science as Inquiry,
Life Science

Preparation

Review the Teacher Background Information on **Master Pages 4.2 - 4.4**; make copies for each student of **Master Page 4.11** and of **Master Page 4.12**, one per every two students and pre-cut in half; pre-cut a set of circled animals on **Master Page 4.12** and attach masking or two-sided tape to the back of each circle, set aside; have scissors and glue readily available.

Time

One 50 minute session

Vocabulary

Bark Scorpion, Centipede, Flycatcher, Gopher, Habitat, Mesquite Bug, Praying Mantis, Rabbit, Squirrel.

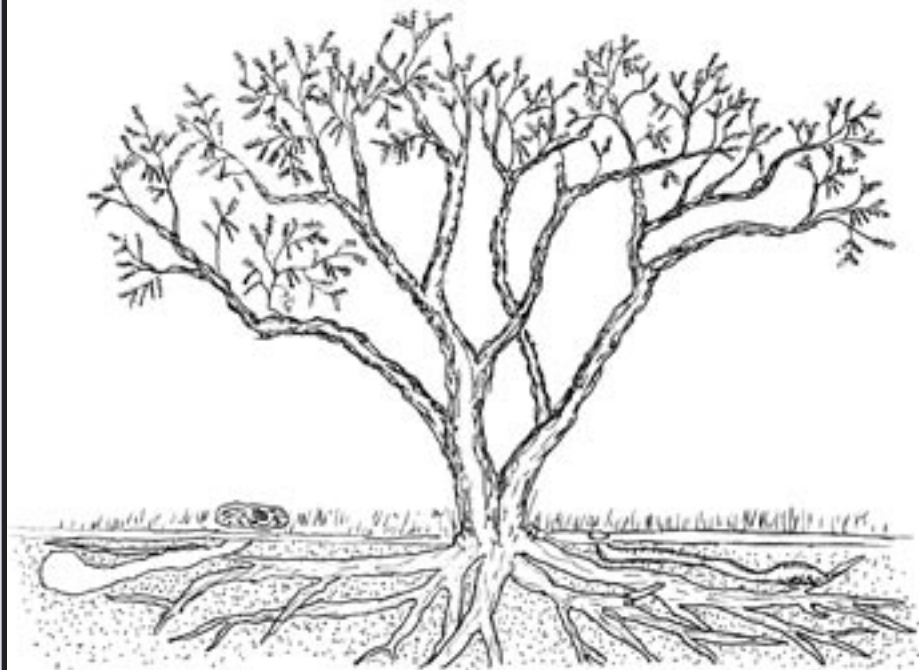
MESQUITE HOUSE

1. In preparation, take a copy of **Master Page 4.11** and hang it in front of the class where all students can see it. Pre-cut a set of ten circled animals from **Master Page 4.12** and place masking or two-sided tape on the back of each circle. Stick them next to the displayed mesquite tree picture.

2. Ask students what they know about the mesquite tree. What can they remember from Lesson 7, *Dress a Tree?*, Can the mesquite be used to make medicine or food?, What kinds of animals use the mesquite and how?

3. Define or review

Habitat: the area that provides an animal or plant with food water, shelter, and living space.



4. Hand out copies of **Master Page 11** and the half page of the ten circled animals on **Master Page 4.12** to each student.

5. Using the Teacher Background information on **Page 4.2 - 4.4**, separately discuss each animal species and how it might use the mesquite as a habitat.

Note: depending on time and student attention span, you may choose to skip step number 5.

6. Hand out scissors and ask students to cut out the animal species (circled) on **Master Page 4.12**.



7. Have students arrange each circled animal to correspond with the proper placement on their individual copies of the mesquite tree from **Master Page 4.11**. For example, the gopher would be located in number 9 below the ground, whereas birds would be perched on a branch. (Note that each species may have more than one placement.)



8. While reviewing each animal and its proper habitat, stick the pre-cut animals onto the displayed copy of **Master Page 4.11**. (Use the numbers in parentheses on **Master Pages 4.2 to 4.4** as a guide for proper placement. Repeat this for each of the ten animal species while students rearrange their own pictures with the correct animals.

9. Have students glue the animals onto their respective habitat around the tree.

10. If time allows, complete the activity by reviewing the selected species and their relationship to the mesquite tree. Discuss other animals that might use the mesquite tree.

